A PERCIVAL MARSHALL PUBLICATION

MODEL SHIPS AND POWER BOATS

APRIL 1950 ONE SHILLING

Model Ships and Power Boats

INCORPORATING *Ships and Ship Models*

EDITED BY EDWARD BOWNESS

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Contents

The Ship's Log

'THE MODEL ENGINEER' EXHIBITION

THE dates for this year's exhibition are from August 9th to 19th. Competition models will be received on Tuesday, August 8th, the last day for sending in entry forms being Monday, July 3rd. Competition forms will be available in April and club secretaries are asked to write to the Exhibition Manager, 23, Gt. Queen Street, London, W.C.2, for any further information they may require.

As this year will be the 25th anniversary of "our" exhibition, we ask that as many societies and clubs as possible will support the exhibition with displays of their craftsmanship either in the Competition Section, or by taking a stand which will be given to them free by the organisers.

Where possible, models will be shown under construction so that the public may see the workmanship involved and be better able to appreciate the many fine examples displayed on the competition stands.

The classes in the Ship Models Section are the same as last year, except that the Miniature Section is more clearly defined. A new trophy for ship model societies has been presented by Mr. M. Maltby, vice-chairman of the Sheffield Ship Model Society. It will be awarded to the ship model society scoring the greatest number of marks, the marks being graded according to the class of the award won by the various club entries. The idea is to encourage a larger number of entries from each club and at the same time to raise the quality of the entries. The trophy consists of a steering wheel on an appropriate mount, with ten spokes, and each year the name of the winning society will be engraved on a shield on the rim. At the end of ten years the society registering the greatest number of wins will retain the trophy permanently. This, of course, is in addition to the Club Team Cup, which is competed for by engineering as well as ship model societies.

OUR COVER PICTURE

This month's cover picture was taken at the Grand Regatta, Victoria Park, the day following the closing of last year's *Model Engineer* Exhibition. It demonstrates very clearly the variety of interest, both as regards type of vessel and size of model, to be found in the building of models of power driven prototypes. So many of our readers look on power boats as hydroplanes and speed boats, whereas some of the finest shipmodelling is done in the building of models of power-driven ships. In the centre of the picture we see Mr. Godfrey with his 7-ft. cruiser *Conquest*, a very fine piece of work. Immediately to starboard is Mr. Maclellan's model trawler, which won the prototype cup, repeating his victory of the previous year with a similar model. Mr. Fidler's 6-ft. destroyer *Javelin* is on the extreme right with the late Mr. Whiting's well-known steam yacht in the background. Two paddle steamers, a cargo liner and a group of tugs and a cabin cruiser in the foreground complete about as representative a group as could be seen anywhere.

Owing to a slight misunderstanding the model yacht shown on the cover of our February issue was ascribed to Mr. R. Glanville, whereas the actual owner is Mr. W. W. Beck, of Hampstead, N.W.3. the Commodore of the Highgate Model Yacht Club. Also the model is a 10-rater and not an "A" class, as stated. We tender our apologies to Mr. Beck, and trust he has not been inconvenienced by the mis-statement.

*MODEL MARINE POWER PLANTS

by *Edgar T. Westbury*

MODEL power boat builders rarely attempt to build their own electric propulsion motors nowadays, and one reason for this is because there are quite a number of well-made low-voltage motors available on the market, most of them so inexpensive that if judged purely from the economy aspect it is hardly worth while to attempt making them. To anyone interested in this particular class of work, however, electric motor construction presents no very formidable problems, and a good deal of reliable data on their design is available. The "M.E." handbook "Small Electric Motor Construction" contains several designs for motors of a size and type well suited to model boat propulsion, with tables of windings to suit various voltages, and specifications of materials. In cases where large or specially powerful motors are required, it may be found necessary to construct them, as nearly all the motors now on the market are of the miniature type, and the larger motors, such as that produced some years ago by Messrs. Bassett-Lowke under the name of "Nautilus," do not appear to be available at the present time. It is, however, always possible to use two or more of the smaller motors, either to drive separate propellers, or geared to a single shaft. Unless it is desired to put individual propellers under separate control (as might possibly be desirable for certain systems of remote control) it is generally advisable to synchronise them, by gearing or belt coupling, to make certain that all shafts turn at the same speed, or approximately so.

Some excellent electric motors are now available on the "surplus" market, many of them being both compact and powerful, but in nearly all cases they have the disadvantage of requiring voltages greater than can conveniently be obtained from batteries suitable for model boat installation. Few of these motors are rated at less than 12 volts, and those most readily obtainable are more often rated at 24 volts, though in some cases they have built-in regulating resistances which may be removed or short-circuited, enabling the motors to run efficiently on much less than their rated voltage. It is, of course, possible to rewind them to run on lower voltages. A 24 volt motor, to run at full efficiency, will require 16 dry cells at 1.5 volts, 12 lead-acid secondary cells at 2 volts, or 19 alkaline cells at 1.25 volts ; in all cases, of course, the cells are connected in series. It is clear that for either type of accumulator, the expense will be fairly considerable, and also the bulk and weight, at least in the case of lead-acid cells. If, however, these disadvantages can be tolerated, it may be found well worth while to use the high-voltage motors, owing to their greater electrical efficiency. As power output depends upon wattage, the current consumption is in inverse proportion to the voltage, with the result that brush losses and mechanical friction—both of which are deadly enemies to efficiency in small motors—can be much reduced by increasing the voltage rating. Having regard to the reduction in current consumption, smaller-capacity cells may be used, and as dry batteries are available in a wide range of sizes, it may be found just as convenient to use 16 small cells as three or four large ones.

CURRENT CONSUMPTION OF SMALL MOTORS

Tests have been made of several of the small motors now on the market, rated at 4 to 6 volts, and varying widely in design, some having permanent magnet fields and others wound (electro-magnetic) fields. The armatures are in all cases of the tripolar type, having three pole shoes, each with its own individual coil winding, and a three-section commutator. This is the simplest form of armature which is self-starting (a two-pole armature is liable to stop on "dead centres" after which it will not restart without manual assistance), and gives reasonably good results on low voltage motors, though smoother torque and better commutation, with less sparking, are obtainable by increasing the number of armature poles and commutator segments. Most of the motors have the orthodox cylindrical commutator, though disc commutators are used in some cases, for convenience in production or to shorten the axial length of the motor. The use of springy strips of hard brass or bronze as commutator brushes, which was once common, seems to have been generally superseded by copper-carbon brushes, which have better current carrying capacity, lower friction, and longer life than the former type. In motors with wound fields, the field and armature windings are nearly always connected in series, an arrangement which provides the maximum starting torque, and ease of speed regulation, which is done by varying the applied voltage, such as by the use of a series rheostat.

It is not proposed to publish the actual test figures of the motors, mainly because it is extremely difficult to ensure that the test conditions are exactly accurate and constant in all cases. In some cases the motors were found to take less current after running a few minutes, a characteristic usually ascribed to "warming up," though only moderate temperature variation was detected at maximum rated voltage and fairly heavy load. Speed is difficult to measure accurately on motors of low power, because the application of almost any form of counter or speed indicator increases the load sufficiently to make an appreciable difference in r.p.m. A calibrated stroboscope is the ideal instrument for this purpose, as it works entirely

*Continued from March issue, page 4.

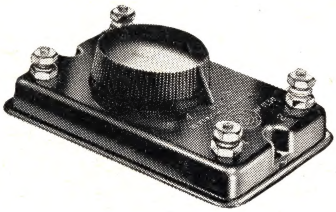
visually, and without any mechanical contact with the rotating shaft ; but it is an expensive instrument, and was not available for these particular tests. Neither was it possible to make exact observations of torque, which would have called for delicate adjustment of friction and weight.

The object aimed at was simply to form general conclusions as to the utility of these small motors for the purpose under consideration, and a rough idea of their current consumption under working conditions. It was found that while they will, in nearly all cases, run at well below their minimum rated voltage, the best all-round efficiency is obtained near the top of the voltage range. This may appear to be merely stating the obvious, but it refers not only to the actual speed and power developed, but also to power in *relation to current consumption* ; the input current does not rise in direct proportion

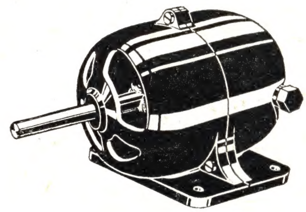
The only practical advantage of the wound field-magnet for small motors is that it renders them capable of running on alternating current ; but that is of no account in the application of motors for boat propulsion, since they must necessarily run from a source of power carried entirely by the boat itself, in other words, a battery of some kind. There is a possible exception to this in model boats used in research tests, which have in some cases been driven by motors supplied with current through a cable from an outside source of power.

CONTROL

Most small boat motors are run at one speed and in one direction, but occasions arise where it may be desirable to provide for control of speed and also reversing ; as, for instance, when the boats are controlled by radio or other remote-control systems.



The S.E.L. reversing switch unit



The Frog " Whirlwind " permanent-magnet motor

to applied voltage as might be expected. The no-load current of the motors was from 0.2 to 0.3 amperes in most cases, rising to over 0.5 amperes under reasonable load, except in the largest and most powerful of those tests, where it was 0.75 amperes. In all cases it was possible to overload the motors to take over 1 ampere without stalling, or encountering any other electrical or mechanical trouble.

PERMANENT MAGNET MOTORS

The use of permanent magnet fields is very popular in small motors nowadays, and with good reason, as it not only simplifies construction and reduces bulk and weight, but if properly applied, also increases efficiency. In small motors with wound fields, the latter can only be energised by the expenditure of current, and it is often found that the amount of field required is excessive—certainly it is much greater in proportion than that necessary for larger motors. The existence of a powerful field produced by a permanent magnet eliminates this expenditure of current, and enables all the available current to be utilised in energising the armature. Modern magnet steels enable a very powerful magnetic field to be set up with straight bar magnets of very small size, and have largely superseded the older type of " horse-shoe " magnet, though the latter is still used in some cases.

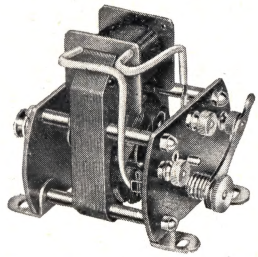
It is quite an easy matter to vary the speed of any small motor by fitting a rheostat in the circuit of a current carrying capacity and resistance suited to the particular type of motor. In the case of the small motors quoted above, the rheostat should be capable of carrying not less than 1 ampere, and have a resistance of 5 to 10 ohms, according to the range of speed control required. This, of course, applies to a single motor ; if a number of motors are wired in parallel and controlled from a single rheostat, the current capacity should be increased in proportion to the number, and the resistance decreased in inverse proportion.

It is not known definitely whether rheostats of a type specially designed for small motors are now available, though they were once common. The type most popular comprised a circular base with a self-supporting " toroidal " coil (i.e. a long helical coil bent into a circle) and a rotating brush to make contact with the coil at any point required. It is of interest to note that this simple device was developed into the filament current control, which used to be a very necessary adjunct to early radio valves, and if one can obtain the rheostat from an old wireless set which used " bright emitter " valves, it will be found quite suitable for controlling a small motor. The same principle of construction is used in modern volume controls and potentiometers, but their resistance is much too high for the purpose

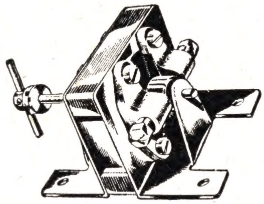
in question, though a heavier resistance coil could be fitted in some cases.

Permanent magnet motors can be reversed simply by changing over the polarity of the supply leads, but wound-field motors necessitate changing over the polarity of either the field or the armature, *but not both*, so that the switch wiring is a little more complicated, and in some cases, rather inconvenient, as in electric railways, where it is desired to reverse them from the supply line. Where the switch can be fitted directly on, or close to, the motor, however, there is little difficulty with either type. Reversing switches must be of the double-pole two-way type ; an interesting and compact switch of this type, manufactured by Signalling Equipment Ltd., of Potters Bar, Herts, is illustrated here.

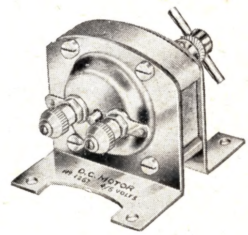
Switches or other controls can usually be fitted very unobtrusively to model boats so that they do not show up as excrescences to deck fittings or superstructure, in such a way as to interfere with scale realism. They may be semi-concealed in a cockpit or wheelhouse, under an easily lifted hatch, or inside a small skylight or deckhouse. In many cases the switch is " camouflaged " by disguising it as a capstan, ventilator, binnacle or searchlight, and a good deal of ingenuity has been devoted to devising fittings of this nature, which not only preserve fidelity of the boat's appearance, but also form " secret " controls which help to protect it from meddling fingers.



The S.E.L. wound-field (A.C.-D.C.) electric motor



The Frog " Reomaster " permanent-magnet motor



The S.E.L. permanent magnet motor

POWER OBTAINABLE FROM ELECTRIC MOTORS

It was mentioned in last month's issue that one should not expect to be able to obtain performances comparable with those attainable with the most powerful steam or i.c. engines when using electric motors. The limitation is not so much in the motor itself, which could, if necessary, be made to produce quite a large power for its size, but in the available current supply, which is restricted by the bulk and weight of batteries in relation to their maximum permissible output.

The power obtainable from an electric motor is determined by the wattage (the product of volts and amperes) put into it, and the unit of electrical horse-power is 746 watts, which means that this amount of current, if utilised at full 100 per cent. efficiency, would produce mechanical power equal to 1 h.p. at the motor shaft. But all power conversion involves some loss, and even in fairly large motors it is difficult to obtain more than about 70 to 75 per cent. efficiency, which means that not less than about 1,000 watts would be required to produce 1 h.p. In a small motor it is doubtful whether more than 50 per cent. efficiency (1,500 watts per h.p.) is ever attainable.

Working on this basis, a small motor consuming 0.5 amperes at 6 volts (or three watts) could not be expected under any circumstances to produce more than $\frac{3}{1,500} = \frac{1}{500}$ h.p. Even if we install a powerful motor and load the boat to its maximum cargo capacity with batteries, it will be difficult to improve to any great extent on the performance, because the increased weight will react on the total power/weight ratio of the craft, which is the ultimate deciding factor in the speed of the boat, when everything possible is done to improve the efficiency of hull design and propulsive machinery. Generally the best course is to keep the craft as light as possible, and make the most economical use of a small amount of current. In the past, boats of 3 ft. or 4 ft. in length have been fitted with 12 volt motors taking up to about 4 amperes (50 watts) but this represents only $\frac{1}{50}$ h.p., even when the full current supply can be maintained, which is not often. It will thus be seen that the idea of propelling a model speed boat at anything like high speed by means of an electric motor presents some very formidable problems, to say the least.

Nevertheless, the electric motor fills a definite, and by no means insignificant place in the scheme of model power boat propulsion, and there are many types of models in which it is the only form of power really practicable. Perhaps the worst that can be said about the electric motor is that its mechanical simplicity and unfailing utility tends to render it rather uninteresting to the model enthusiast, who is liable to become somewhat bored by a power plant which does not continually present a challenge to his patience and initiative, but simply goes when you switch it on !

P. S. *Royal Eagle*

A WORKING MODEL by F. W. BOYD

THERE is a reason for everything, even for the model of the *Royal Eagle*. The first requirement was a model pleasant to look at, the second, connected with the first, a paddle steamer, the third, a working model. The problems were (1) to obtain drawings and information, and (2) to marry the aesthetic with the functional in a working model; which is not always an easy matter.

Drawings of hull lines do not appear to have been published, but the Steam Navigation Company were kind enough to send photographs, so a chance at designing was taken. I recommend an essay at this to all interested in model boats.

The known measurements were: length, 36 in.; beam, 5 in. approximately at LWL; draught unknown, but to be kept shallow as in full-size paddle steamers, say $1\frac{1}{2}$ in. Pleasing proportions were essential. A deep hull is an easy way of obtaining more displacement. It is also an easy way of spoiling proportions and obtaining a deep-bellied monster. Displacement, proportion, and stability go together and are not difficult to experiment with.

DISPLACEMENT

(1) Take the volume of the unshaped rectangular block below the water line. $L \times B \times D$.
(2) The final volume obviously is a simple fraction of this. Multiply by the known or estimated fraction known as the block coefficient. In this case 0.7.
(3) Convert to weight by assuming this volume to represent an equal volume of water. 0.04 per cu. in.

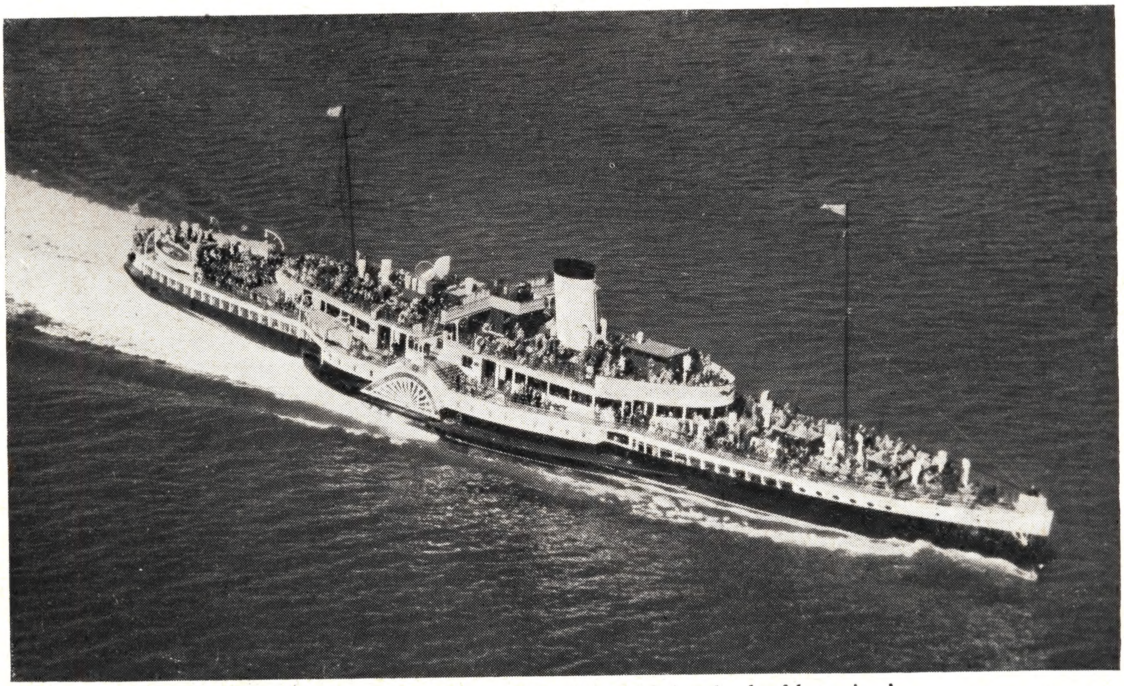
So $(L \times B \times D) \times$ block coefficient $\times\ 0.04 =$ displacement or weight of finished vessel.

Thus $36 \times 5 \times 1\frac{1}{2} \times 0.7 \times 0.04 = 7.56$, say, $7\frac{1}{2}$ lb.

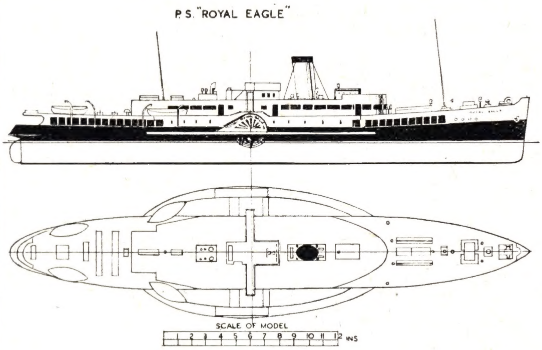
STABILITY

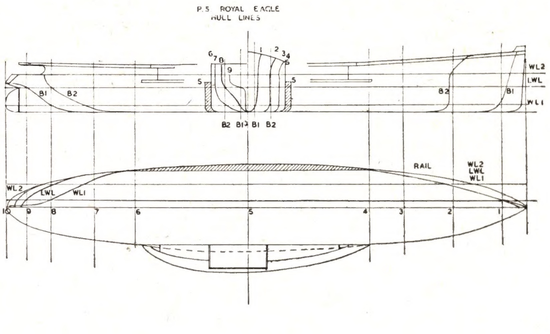
(1) Make midship underwater section of cardboard with 15 deg. of list. Fig. 1.
(2) Take cotton plumbline from corners *A* and *B* and obtain *CB* (centre of buoyancy). Fig. 2.
(3) Estimate the centre of gravity of the model. Figs. 3 and 4.

PHOTO. BY COURTESY THE GENERAL STEAM NAVIGATION CO. LTD.

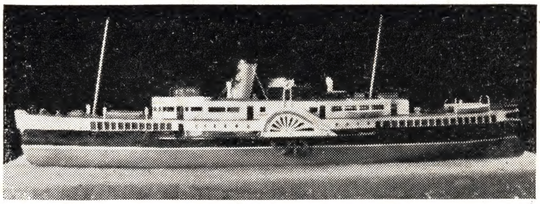


P.S. 'Royal Eagle,' the prototype of the model, 'on her lawful occasions'





A Broadside view of the completed model which shows how successfully Mr. Boyd has acheived the three objectives outlined in the opening sentences of his article. Certainly she is a model pleasant to look at.



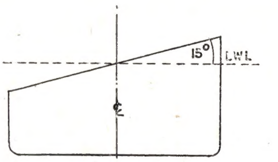
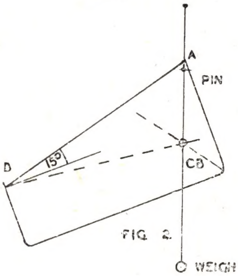


FIG. 1.



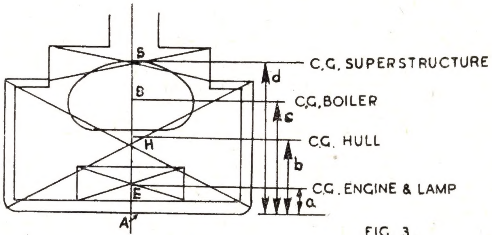


FIG. 3.

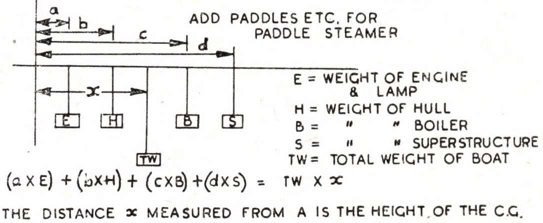


FIG. 4.

(4) Draw the heeled section with CG and CB in position, waterline horizontal. The weight of the vessel is represented at CG as a force vertically downwards.

The force at CB is equal and vertically upwards.

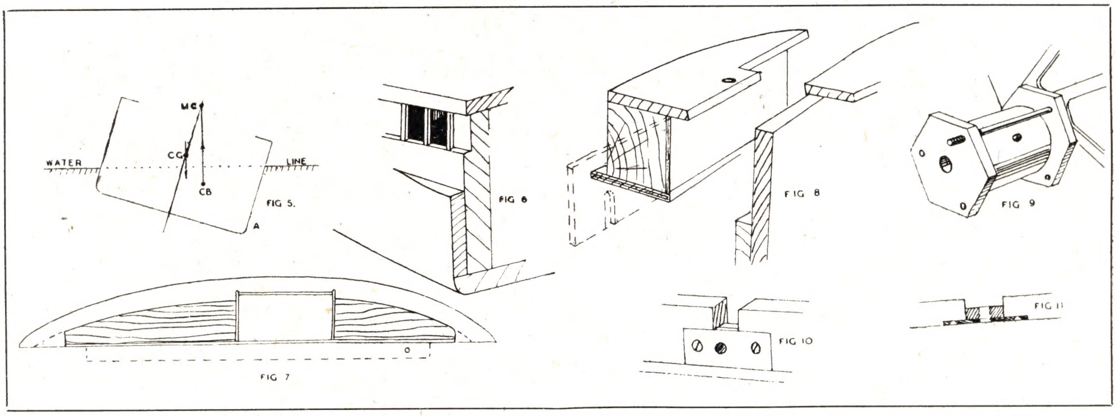
The metacentre is the point obtained by cutting the centre-line by the vertical line through CB, the centre of buoyancy. Fig. 5.

Observations: (a) The higher MC above CG, the more stable the hull; (b) if MC is below the CG, the hull will capsize; (c) a hull section which gives CB far away from the centre line is on right lines for stability if the CG is not known.

Advantage was taken of the overhanging paddle boxes to increase the beam by $\frac{1}{2}$ in. without affecting the appearance. This is shown in the drawings.

CONSTRUCTION

Hull. The hull is cut from a piece of deal, 5 in. × 3 ft. Two blocks are glued amidships to increase the beam under the sponsons. A waterline $\frac{5}{16}$ in. from the bottom was developed and a piece of mahogany cut to this shape to give the floor of the hull. This gives an easy modified bread-and-butter construction suitable for steamers. The interior of the upper layers was removed by jig saw before the hull was assembled with waterproof



glue. No pins, dowels or sewing is necessary with modern adhesives of the synthetic resin variety.

The rebate for the saloon windows is cut before fixing the decks. Dark blue paint and varnish represents the glass and divisions are fixed with Durofix. For convenience and neatness these may be prepared and painted in long strips. Fig. 6.

Sponsons and Paddle Boxes. The paddle boxes are made of thin plywood, the sides being cut in pairs and filed up together. A jig is most useful to bend and hold the cover during the setting of the adhesives. Next come the sponson decks and houses, built from ¼-in. resin-bonded plywood, balsa wood, with a top deck of mahogany. It is important to fit a piece of plywood the full length of these units at the back so that they can be safely handled when removed from the hull. See Figs. 7 and 8.

Paddle Wheels. Thin plywood bolted to turned brass hubs makes very good paddle wheels. The hubs are turned from hexagonal brass bar, and fixed to the ¼-in. shaft with grub screws. The present wheels have the blades set tangenically to a small circle to suggest feathering but a second pair with rather larger blades fixed radially is contemplated and a comparison between the two, with the boat afloat, should be interesting. My belief is that simplicity is well worth while in a small boat. Bearings, as shown in Figs. 10 and 11, are let into the side of the hull. Motive power at present is an electric motor running on 6 volts obtained by the use of dry batteries, and the paddle shaft is rotated through worm gearing.

Superstructure and Deck Fittings. With a view to tightness, thin tinplate is used for the funnel and superstructure. If, as contemplated, a light steam plant is ever fitted, ample ventilation can be obtained through window spaces. Of course, the whole of the superstructure is removable. All other deck fittings are made of wood and have been kept as light as possible, so deck houses, winch ventilators and boats are of balsa and the seats, varnished like the deck, are mahogany.

The vessel is quite stable without motor or ballast. The motor and batteries just bring her to her marks; then she looks beautiful.

FOR THE BOOKSHELF

An Account of the Construction and Embellishment of OLD TIME SHIPS

Published by the author, John R. Stevens, 165, *Ronan Avenue, Toronto* 12, *Ontario, and can be obtained from Francis Edwards Ltd.,* 83, *Marylebone High Street, London, W.*1, *price* £3 15s od., *post free ; approx.* 240 *pages,* 12 *in. wide by* 9 *in. high.*

As will be gathered from its title, this book will be found intensely interesting to the student of naval architecture, especially if his period is the 18th and early 19th centuries. Much of the material is new and the author's drawings and sketches of details are very clear and informative. The first main section of the book deals with hull construction as a whole. The second traces the development of the head from c. 1300 up to the early 1800's. The next section describes the stern, and the fourth the broadside details. The four appendices include valuable quotations from Sutherland's "Shipbuilding Unvail'd," 1717, and Griffith's "Treatise on Marine and Naval Architecture," New York, 1854, concluding with tables of "the Principal Dimensions and Scantlings" of a ship from the 1789 edition of the "Shipbuilders' Repository," including dimensions for 16 sizes of ships from 100 guns downward, and covering 50 pages. Three beautifully reproduced plates of an 80-gun ship, probably from Steel's "Naval Architecture," are included, forming a treatise in themselves. The whole is supplemented by 38 large plates and a frontispiece showing complete views and close-up details of many famous ship models, including contemporary models of the 15th and early 17th centuries' ships from Rotterdam and Stockholm. Our chief and almost only criticism is of the loose-leaf style back with spiral spring type binding, which we do not consider sufficiently durable for a book of reference such as this, although admittedly it has the advantage of being able to lay out the pages perfectly flat. The present edition is limited to 500 numbered copies.

OUR READERS' MODELS No. 2

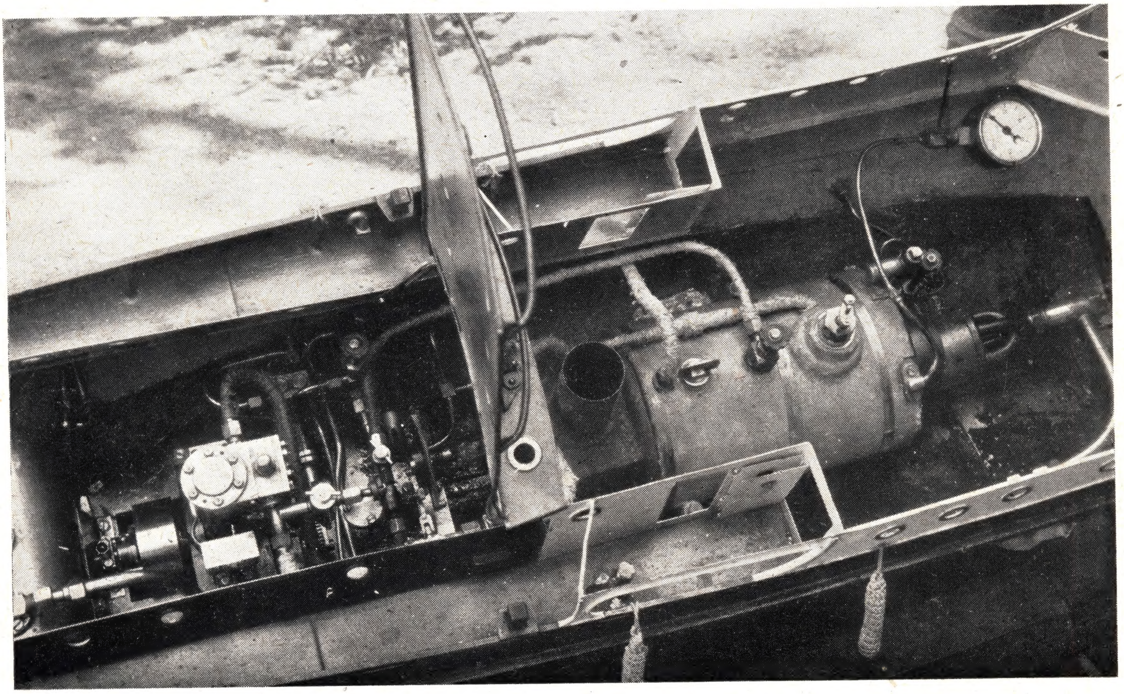
A Working Model Steam Tug

by R. L. Allen

SOME time ago a friend of mine wanted a model tug boat which he asked me to build for him. After seeing several pictures of the real tugs, chiefly from the Merseyside, it was decided to build a model of the Alexander Towing Co.'s 2,500 h.p. steam tug *Shoyne*, of Liverpool.

He rather liked this boat as it had several advantages for modelling, i.e. easy access to the power plant, and she should look like a tug when finished. A picture post-card was all I had for a guide. It was taken at three-quarter view and a fair amount of detail could be seen. Having by me drawings of the model tug *Gondia*, which was described in *The Model Engineer* some years ago, I decided to use this for the hull design as it lent itself well to the lines of the prototype.

First the plant was made ; this may seem rather a strange way to proceed, but after building several boats of all kinds, I soon found out that this was the safest way. I had noticed after building a beautiful hull it would nearly always be spoiled by having to cut bits out and hack away the metal in places to



The power plant with superstructure hinged up showing accessibility

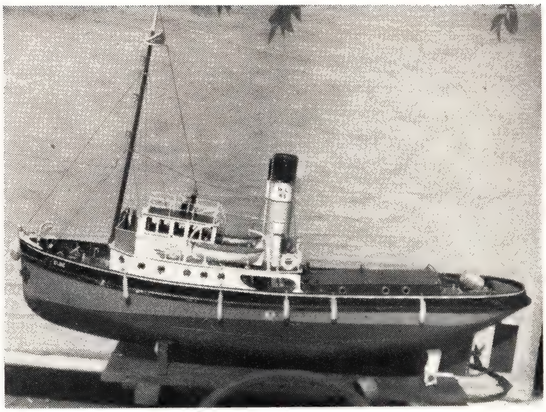
receive the power plant. All sorts of snags would pop up, so by making sure of the plant complete in detail to fit the hull, these snags soon disappeared and one could go right ahead with building the hull, knowing it would be an easy thing to install the plant later on.

Here is a brief description of the plant. The engine is a single-cylinder slide-valve, $\frac{3}{4}$ in. × $\frac{3}{4}$ in bore. and stroke with trunk guide and the crankshaft running in ball bearings enclosed in oil bath housings. They and the crosshead, big-end and eccentric are lubricated by gravity feed from an oil tank attached to the engine. The cylinder is supplied with oil by means of a displacement lubricator. The boiler is of the centre flue type and is complete with smoke box and the usual fittings. The barrel is 6 in. long by 4 in. diam. with a 2 in. diam. centre flue containing eight $\frac{3}{4}$ in. diam. crosstubes. The boiler is made of copper throughout. There are feedwater heating tubes, also a superheater in the smoke box. It steams well and fast, working at 60 lb. pressure and is fed by a mechanical water pump, $\frac{1}{4}$ in. bore by $\frac{5}{16}$ in. stroke, which is driven from the main engine, driving a $2\frac{3}{4}$ in. diam. by 4 in. pitch propeller and also an auxiliary pump, which pumps water overboard and looks like the real thing when the boat is hove to or under way. There is also a hand pump fitted and all filters are accessible for easy cleaning. In the exhaust pipe there is an oil and steam separator, also a blase nozzle. I tried several size nozzles before I found the right one to suit the draught for the furnace, which is fired by a paraffin blowlamp. The burner is placed forward and the container which is complete with pump, air release and filter cap, is placed aft.

Now for the hull : this is 42 in. long by 10 in. beam and is constructed of copper, brass and tem-plate. The keel is $\frac{1}{4}$ in. × $\frac{1}{4}$ in. square brass, the stem post $\frac{1}{4}$ in. × $\frac{1}{4}$ in. brass angle and the stern were cut from $\frac{1}{8}$ in. sheet brass plate and is complete with stern tube and hinges for the rudder, the whole being silver-soldered together.

This was placed on a building board and checked up for truth and secured in that position. The frames were next soldered in place, using soft solder, and the

'*Elsie*' *receiving last-minute adjustments*



'*Elsie*' *ready for launching*

complete deck plates fastened on the frames. This prevents the frames from moving. Next the hull top plates were put on, the keel plates and bilge plates, and so on until the hull was complete as far as the deck level. Bulkheads were put in fore and aft. This strengthens the hull considerably and is well worth the little extra weight. The hull was now removed from the board and all the plate joints checked for water tightness. The plant was next placed in the hull and the holding-down plates and lugs were soldered into place. These have threaded holes and each part of the plant has its own bed and can easily be removed without stripping the entire plant, when maintenance work is in hand.

I then proceeded to fit the deck house, engine room coamings, decks, etc. The bulwarks were next built on and stayed in the usual way. The bollards, anchor, winch, funnel, wheelhouse, mast, and life-boats, and all the small gear which goes to make a ship, were temporarily put in place to see how she was taking place. These were then removed and the hull given a good clean down and all the surplus solder cleaned off. It was then given two undercoats of light grey paint all over, these were well rubbed down and the finishing coats applied. They are as follows :—keel to waterline, oxide red ; waterline to deck level, French grey ; bulwarks, black ; with white line all round ; funnel, light buff, white middle and black top including smoke deflector. The markings are the registration letters and number of my friend's club. The mast is varnished and all lamps and rigging painted silver. Access to the plant is obtained by merely hinging up the boat deck and engine room deck. The mast and rigging collapse. The decks are held open by straps similar to those found on gramophone lids.

It can be seen in the pictures that the tug is com-plete with swivel towing hook. The two ropes are stowed aft of the engine room hatch.

The whole job took just over six months to com-plete in spare time. The pictures I hope will give you some idea what the boat really looks like.

She was christened '*Elsie*' for purely personal reasons, which have no place in this story.

THE MARSTAL MUSEUM

by *Basil Greenhill*

THE symbol of Marstal town is the skonnertbrig, schooner-brig, brigantine to the English visitor with an eye for these things. This vessel with a long-vanished tophamper, smallest of the square rigs and the first to become extinct, is on all the civic property of Marstal, and on the buildings, and on the little spoons you can buy as souvenirs of your visit in the curiosity shops. It is an ancient symbol of the town's great prosperity in the days of sailing ships, and the tall broad-beamed brigantine is indeed the right sign for this ancient town of burghers and shipbuilders and merchants, with its cobbled streets and mellow soft brick houses, and its shallow harbour.

Not that nowadays the three-masted standing topgallant schooner would not be a better symbol, for it was those ships that made Marstal its greatest in the late nineteenth century and the first forty years of the twentieth. In these years the schooner with the Marstal bow, the beautiful curving convex stem first developed for big ships at Marstal and later adopted throughout Denmark, and the Jagt stern, the efficient homely Danish transom, with its lovely pattern of painted and varnished timbers and its crossed flags and gingerbread work picked out in bright colours, went all over the world to bring fortune to the cottages of Marstal. They have their memorial, too, a carved relief on the face of the office of the mutual insurance building and one of three panels of the new war memorial, which has a side for each aspect of Marstal shipping which suffered in that conflict, the schooners, the modern motor sailing fishing cutters, and the steamers.

The last schooner was launched in 1942, but they still build wooden fishing cutters and big modern wooden motorships in the old yard, and they may again build galleases, as the big wooden ketches as large as an English schooner which are still launched at several yards in Denmark, are called. And Marstal has a tremendous atmosphere, not the perfection of Aerøskøbing on the same island, a little port that is not of this earth, nor the busy day-to-day atmosphere of Svendborg, still very much a commercial sailing ship town, but an air all of its own. And it has a museum.

THE MUSEUM

This museum is one of the most remarkable in Europe. It is the museum of a rich small town which rose and fell with small deep sea sailing ships, and to those ships and their life and the things about them it is dedicated. It is one of the small houses of the town, facing a narrow cobbled street, quite unpretentious and like any other building there. But inside you are in another world. There are models of all the classic vessel forms that sailed from Marstal, and figureheads, and relics of every kind, both of the ships themselves and of their seamen, and paintings and photographs.

THE MODELS

The models are of the highest standard, builder's half models, seamen's models, models made locally by craftsmen to record certain ships and ship types. It is only when you see them within the compass of your hands in the builder's half models that you

really appreciate the beauty of these Danish hulls. To the Englishmen, accustomed to straight stems in small ships, or at the best to an attempt at a clipper bow, the economical, simple, and eminently practical upward curving Marstal bow and the accompanying decorated stern are by way of being an acquired taste, notwithstanding that he has something very like them in the lines of the Severn trow. But they are lovely, these Marstal hulls, and there is no waste of timber or of space in them anywhere.

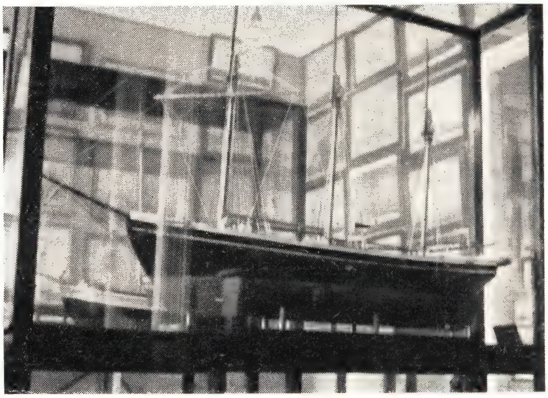
THE PAINTINGS

But it is the paintings and the photographs that are the most impressive thing about the Marstal Museum. Every wall in every room and staircase is lined with water-colours and oils of old ships. Many of these painting are by the English artist Rueben Chapell, of Goole. Chapell is neglected in England, though many of his paintings of small ships hang in west country cottages, but in Denmark his value as a recorder of the sea ways of another age is properly appreciated. There are eighty of his paintings in one private collection in Marstal alone, and one hundred and twenty-five in Svendborg. He recorded every Danish schooner to put into the port of Par in Cornwall, where he lived for many years, and almost every Danish schooner of his period did so, sooner or later.

THE PHOTOGRAPHS

Amongst these paintings, and on walls of their own, and in cabinets, are the photographs, many thousands of them collected from all over the world, of every ship which has sailed those waters in the past three generations. And all this material is not random, without co-ordination in arrangement. Card indexes cover every photograph and painting and record everything that is known of each ship that is represented there, so that the historian or model maker can ask for a certain local vessel and at once find the photographs and paintings which cover her, and the whole life story of her so far as it is known. All this recording is the work of the museum's enthusiastic director, and in it he has been largely assisted by Frobe Holm-Petersen, the energetic doyen of Danish shiplovers, whose remarkable collection of material on the small ships of his country is unparalleled. Mr. Hom-Petersen hopes to start a similar museum in Svendborg one day.

They still build beautiful wooden sailing craft on the waterside at Marstal



A model of a typical Marstal schooner. Note the numerous paintings and photographs on the walls

THE RELICS

Around the models and photographs are the sundry relics of the ships themselves. There is a whole room given entirely to name boards from the bows and sterns of nearly a hundred famous local vessels. There are sea chests and scrimshaw work, shipwrights' tools and sennet mats, a thousand sundries collected by the long voyaging seamen of Marstal, spears, swordfish blades, sharks' teeth, whalebone, souvenirs of Chinese ports, native clothes from South Sea islands, statuettes and knives and old charts.

Those who come to Marstal in search of an understanding of the old ways of small sailing ships will find in this museum not only the facts but the atmosphere and background of the life they wish to recall. There is nothing like it in England. Perhaps we have not in Britain the developed sense of the importance of the history of local ships that is so strong among the Danish islands, and which has given rise to this museum, and to the great private collections at Svendborg, on Turø and Taasinge, and elsewhere on Aerø. Perhaps small ships have never been so important to us as they are to a nation of dwellers on little islands. But if that is so it is a great pity. If the great small ship ports of Britain, Fowey, Bideford, and Portmadoc, have no such collection between them surely there could be a section of a central museum devoted to small ships, to their story, and to the preservation of their own culture, as is this museum at Marstal.

A Model Flemish Carrack

The late C. M. MILLWARD'S *series continued by the Editor*

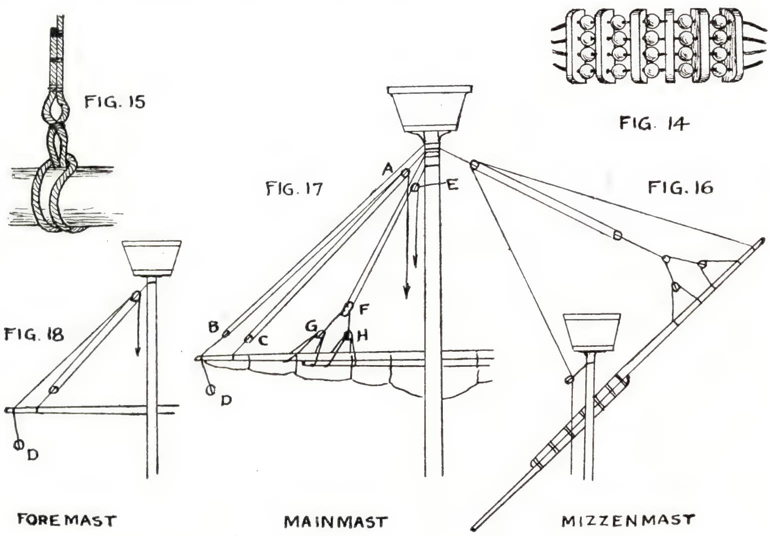
HAVING fitted the shrouds and stays to their respective masts, the tops may now be fitted in place. Before doing so, however, four small holes for the halliards should be drilled through the floor of each of the tops, two in the fore side of the square central hole and two on the after side. A rope ladder with wooden rungs must be fitted aft of the main mast, the foot being secured to the poop deck and the head to two of the brackets under the mast top. There may have been a hole with a trap door to allow of access to the top, otherwise the men would have had to scramble over the rim, but no such trap door is shown in Mr. Morton Nance's model. In any case there would be insufficient space for a trap door in the case of the fore and mizzen tops, especially as the crosstrees would be very much in the way.

The parrels for securing the yards to their respective masts should now be made. They consist of a number of balls threaded on fine ropes, the balls on each rope being separated by a piece of wood which is pierced with holes to take the ropes. The sketch, Fig. 14, will make this clear. It must be noted that the surface of the ball projects beyond the inner surface of the wooden strips so that they rotate on the mast and form a primitive sort of ball bearing. The parrel for the main yard has five rows of balls and seven dividing strips, while those for the fore and lateen yards have four rows of balls and six dividing strips.

The yards should now be fitted to their respective masts. Commencing with the lateen yard, one end of the halliard should be seized to the yard as shown in Fig. 15. It is then taken up through the top, through the hole in the mast, and down through the top and reeved through the halliard block, as shown at *F.* in Fig. 4 in the January issue, page 13. From there it is taken back again the same way and seized to the yard alongside the seizing of the other end, the length being adjusted to give a suitable position for the yard. The main and fore yards are slung in exactly the same way.

Next the yards should be secured to their masts by means of the parrels. The small ropes at one end should be seized to a single rope and this rope lashed or seized around the yard. When the parrel is drawn together around the mast the ends should again be seized to a single rope and this rope led through a block which is rove into a loop around the yard. The parrel rope for the lateen yard is belayed to a pin at the foot of the mizzen mast and that for the foreyard at the after end of the forecastle head on the port side. The parrel rope for the main yard carries the upper block of a tackle, the lower block of which is secured to the rail inside the main shrouds just above the after end of the channels on the starboard side. The standing end of the rope is fixed to the upper block and the running end is belayed to a pin in the rail near the lower block. This tackle may be seen in the cover picture of the January issue. The tension on the parrel ropes should be adjusted so that the yards can be braced around the mast when required. When the yards are being hoisted or lowered the parrel rope will, of course, be cast off its pin and only belayed again when the yard is in the desired position. The positions for the yards shown in our cover photograph are, of course, not essential, but with the sails furled they are quite appropriate.

Peak halliards should now be fitted to the lateen yard. These are shown in Fig. 16. A pendant should be fixed on the main mast just below the top with a double block *A* in its free end. Two spans are fitted near the after end of the yard, each being rove through a single block. A third span having these two blocks on its ends is rove through



another single block which is on a pendant with yet another block B at its other end. This forms a simple crowsfoot. The halliard proper is fixed to the extreme after end of the yard taken through the block A at the masthead pendant, down to the block B on the crowsfoot, back to block A, down through block C which is carved from a pendant under the mizzen top and finally belayed on a convenient pin on the starboard side of the poop. Although they are not shown on Mr. Morton Nance's model I think there should be tackles leading from the forward end of the lateen yard on each side, two blocks being stropped to the yard, the corresponding blocks being fixed to eyes at the bulwarks on either side of the poop deck. These correspond to the braces for the square sails and enable the lateen sail to be trimmed to suit whichever tack the ship is on.

The main yard is provided with independent lifts, one to each end of the yard. Yardarms in the more modern sense were unknown in the period of our model. The arrangement is shown in Fig. 17. Pendants are fitted on the mast over the shrouds carrying blocks B and C. The lift is first secured to the mast just under the top, led down to block B, back to block A, down to block C, back again to block A and finally belayed on a pin in the rail close to the lower deadeyes of the aftermost of the mizzen shrouds at the starboard side. The braces are led through single blocks D on pendants at the ends of the yard, the standing end being fixed to an eye in the rail near the foremost of the four guns on the poop and the running end belayed to a pin just aft of this gun.

The lifts for the foreyard are similar to those of the main, except that there is only one lift pendant on each end of the yard, the lift itself being fixed to the end of the yard instead of under the mast top as in the main. Fig. 18 shows the arrangement. The running end of the lift is belayed to a pin in the rail of the forecastle head, just inside the shroud deadeyes. The braces are led through single blocks on pendants at the ends of the yard, the standing end being fixed to an eye in the rail just aft of the eye for the lift and the running end taken round the corner of the topcastle, and carried across to the cleat on the opposite side under the gangway—the cleat being the one provided for the main tack as explained on page 14 in the January issue.

The sails may be made in complete detail with martuets or leechlines, bowlines, tacks and sheets as in the actual ship, but if they are to be kept permanently furled all that is necessary is to cut them approximately to shape, fold them more or less as they would be folded when furling them up to the yard and lash them in position as shown in the cover picture for the January issue. They should be left full at the bunt (the central position) and the clews folded in so that they come about midway between the mast and the ends of the yard. The various lines can then be attached to the yard at the appropriate positions and if they can be tucked in to appear as though they are attached to the sail and not to the yard, so much the better. When the sails were removed altogether the various lines were actually attached to convenient places on the yards or in the rigging. Working from aft forward the sheets of the lateen sail are rove through pendants. The standing ends are fixed to ringbolts already provided in the tops of the garderobes or lavatories on the counter (see February issue, page 24). After being rove through the blocks on the pendants the sheets are belayed on pins in the poop rail on each side between the third and fourth guns, counting from aft.

The main sail is provided with sheets, tacks, martuets or leechlines and bowlines and thus was controlled in practically the same manner as the square sails of the present century. The sheets and tacks are attached to the clews of the sail and thus, seeing the sail is furled, should come down from a position about midway between the mast and the ends of the yard. On Mr. Morton Nance's model they are seized together some distance below the yard and from that point the sheets are led aft to holes in the poop bulwarks near the transom and the tacks are taken forward of the hole in the short skids mentioned on page 14 of the January issue and belayed on the cleats on the inside of the bulwarks. The arrangement of the martuets or leechlines is shown in Fig. 17. A short pendant around the mast carries the block E (on each side, of course). Double loops around the yard to represent the actual "lines" are rove through the double blocks H and G. These are connected by a short rope rove through block F and into each end the blocks G and H are stropped. A rope is fixed to the mast above the short pendant and below the pendant for the lifts and led down through block F, up to block E and down to the deck to be belayed to a pin in the poop rail between the guns. The bowlines are attached to the yard near the point of attachment for the bowlines and are led forward one on each side of the foremast, through a double block fixed to the bowsprit and belayed or merely tucked in and secured where the bowsprit is lashed to the support for the floor of the topcastle. The rigging for the foresail is arranged in a similar manner, the principal difference being that no martuets are fitted in this case. The sheets are crossed and belayed to the cleats already being used to belay the tacks of the mainsail. The tacks are belayed to pins on the rail of the forecastle head, just aft of the angle at the forward end. The bowlines are led through single blocks on pendants attached to the forestay and led down to a double block on the bowsprit and belayed or secured in the same place as the bowlines for the main sail. All these points are clearly shown on the photograph on the cover of the January issue.

In making his model, Mr. Morton Nance has copied very faithfully the type of block for the running gear as shown in the engraving on which the model is based. These are shown in the sketch Fig. 19 (which will be published in the next instalment) A being the single and B the double block.

Erratum : *For 'anchor' in the 5th line from end of last month's instalment, read 'grapnel.'*

(*To be continued*)

Ships in the News *by Laurence Dunn*

THE *Bloemfontein Castle*, the Union Castle Line's new 17,800 ton motor liner, is due to leave London on April 6th on her maiden voyage to South and East Africa, and will return via Suez. It is the first time that they have built a one-class ship and although she is generally similar in appearance to their *Durban Castle* and *Warwick Castle*, she differs in that she has only one mast amidships close to her very wide funnel, and has a flush-decked hull. She is 560 ft. in length and has a beam of 76 ft. Her builders, Harland & Wolff Ltd., are to build two more similar size ships for the company.

* * *

Empire Bure and *Empire Helford*, two of the Ministry of Transport's older troopships have been sold. The former, which has gone to an un-named firm is a single funnelled ship of 8,302 tons gross. She was built as the *Elisabethville*, by Cockerills, of Hoboken, in 1921, for the Belgian Congo Line. She was bought by the Ministry three years ago and has been managed by the Lamport & Holt Line. The two-funnelled steamer *Empire Helford*, 6,852 tons, which has been bought by Germans, has had a most varied career. She was originally ordered by the Russian American Line for their emigrant service and her builders, Barclay Curle & Co., had her ready in 1915. The war upset original plans and as the *Czarita* she was requisitioned, put under the management of the Cunard Line, and used as a trooper. Later she became the Danish *Lituania*, the *Kosciuszko* of the Gdynia America Line, and then, during the second war, the Polish Naval Depot Ship *Gdynia*, before becoming the *Empire Helford* in 1946.

* * *

Dartmoor and *Exmoor* are the names given to two very fine looking cargo ships built and engined by Doxfords for the Moor Line. The former has recently been completed while her sistership is still fitting out. They have an overall length of 444 ft., a service speed of 13 knots and can carry about 9,150 tons. They have a topgallant forecastle and a long superstructure amidships, suggestive of passenger accommodation. The extra cabins here, built either side of the hatch situated between bridge and funnel, are for the crew, who are all berthed amidships.

* * *

Following the *Port Adelaide*, which is now being demolished at Rosyth, the Port Line's s.s. *Port Caroline* has been sold for scrap. A twin screw, geared turbine driven ship of 8,145 tons, she is being broken up by Smith & Houston Ltd., of Port Glasgow. She was built in 1919, by Workman Clark & Co. With their demise only two ships of this type are left in the Port Line fleet. These are the almost identical *Port Campbell* and the *Port Darwin*, of 1918, which was the last ship that they had built with a counter stern.

Givemework is the pathetic name given to a 1,380-ton Maltese owned steamer. Well known on the Thames in byegone days, she was originally the collier *Tempo*, built for the Pelton Steamship Co. Ltd., in 1911, by Austins. After about 20 years on their service she was sold to Achille Lauro, of Naples, who renamed her *Polinice*. About four years ago she was bought by her present owner Mr. E. Schembri, of Malta, who then gave her the name *Reborn*. May his new choice of name prove a success !

* * *

The M.V. *Lochwood*, a single-screw Mediterranean trader has been completed at Burntisland for the Wood Lines Ltd., of Middlesbrough, which is associated with the Joseph Contantine S.S. Line. She is 267 ft. in length, b.p., has a gross tonnage of 1,689, and carries 2,370 tons. In appearance she is very distinctive, with cruiser stern, short topgallant fo'c'sle and short lofty super-structure between the second and third and last hatch. The mainmast which serves it, is against the superstructure and close to the tapering and slanting topped funnel. She is a 12½-knotter and has accommodation for twelve passengers.

* * *

The 7,488-ton passenger and cargo liner *Protea*, formerly a well-known unit of the American Merchant and then the United States Lines has recently had another change of ownership. She was built at Hog Island, in 1918, as the U.S. Transport *Cantigny*. With her double ended appearance and absence of sheer, she and her sisterships were anything but beautiful to look at. As the *American Banker*, however, she proved very popular on the London-New York run. Early in the second war, for political reasons she was put under the Belgian flag and renamed *Ville D' Anvers*. Later she was bought by the Mediterranean Lines Inc., of Panama, who also owned the liners *Argentina* ex-*Bergensfjord* and *Atlantic* ex-*Malolo*. Now she has been sold to other Panamanian owners with a time charter to I.R.O.

* * *

The small Norwegian coaster *Rask*, which was wrecked early this year on the North East Coast, was more interesting than one would expect. Originally the *Kilmun*, one of the double-ended " Kil " type ships, she was the last of her class to retain her old name. After many years in the Royal Navy, latterly as a cable ship, she was sold in 1947 to Norway. Her new owners converted her into a motorship and completely altered her appearance. Renamed *Rask*, she emerged as a normal looking machinery aft type coaster with one very long well deck.

* * *

The 5,843-ton steamer *Nijkerk* has been sold to Dutch breakers, after about 30 years' service with the United Netherlands Nav. Co. She was originally

the *Pangani*, built by Blohm & Voss, in 1915. Later surrendered to Britain and renamed *Cassio*, she sailed for a short time under the Red Ensign and various managements, including that of the Glen Line, before being bought by her late owners. She is noteworthy as being one of a now nearly forgotten group of cargo liners 420 ft. long, built by various German yards with a very unusual hull arrangement.

S.S. Nijkerk

They are best described as having a flush deck with a plated bridge deck superimposed amidships and a very short well in front of the foremast. Above the bridge deck was a normal split superstructure. This arrangement made them very easy to identify at sea, being quite unique to the class, which also included the Duetsche Ost Africa's *Muansa* and *Urundi*, as well as the *Kagera*, which later became the *Indiana* of the French line.

* * *

The *Mombasa*, a very handsome little coastal liner, has been built by Henry Robb Ltd., of Leith, for the British India Line's East African coastal service. Machinery and massive superstructure is amidships, with two hatches forward in the well deck and one aft, a rather surprising contrast to their earlier *Sofala*, which has machinery aft. She is 250 ft. long b.p. and as well as carrying 1,364 tons of cargo, has cabins for 24 passengers as well as deck space for a further 150. She sailed from London on her maiden voyage in February and is not to return to Britain, Mombasa being her future home port.

* * *

Eleven years to build! Such is the unenviable record held by the 7,750-ton Dutch cargo steamer *Stad Breda*, which was completed late last year for the Halcyon Lijn, of Rotterdam. She was one of two sisterships ordered in 1938 by the German Hansa Line from a local shipyard. After the occupation of Holland the Germans charged the Dutch Van der Giessen yard with the construction of one of the ships. Launched in October, 1944, as the *Schonfels*, she was towed to the German shipyard for completion. Later, after the German surrender, she was found sunk in shallow water, but little damaged, near Bremen. Later she was raised only to be claimed by the Dutch Government as war booty. Flying the Dutch flag she was duly taken back to Holland and had to visit three different shipbuilding firms at Krimpen a/d Yssel, Vlaardingen and Flushing before she was finally ready. Fitted with reciprocating engines and exhaust turbine, she is a shelter decker 485 ft. in length.

* * *

The cargo liner *Chindwara*, of the British India Line, is their first post-war ship of this type, designed to carry cadets. Exceptionally fine accommodation is provided for them and twelve passengers. The cadets, aged from 16 to 19, perform all the duties of a ship's crew, but without the hardships of bygone days. They are under the immediate care of a cadet officer, whose sole duty is their training. He is assisted by a chief petty officer. The *Chindwara* is a 14-knot motorship of about 9,000 tons gross and has a length of 485 ft. Built and engined by Swan Hunters, she will be followed soon after by the sistership *Chantala* from the associated firm of Barclay Curle.

* * *

The 8,750-ton cargo liner *Assyria*, is the first ship to be built for the Cunard Steam Ship Co. Ltd.—as distinct from the Cunard White Star Line—since the Mediterranean trader *Bantria* in 1928. A sistership to the *Asia* and *Arabia*, she is expected to join them on the North Atlantic cargo service this summer. The *Assyria* has been built by Swan Hunter & Wigham Richardson, at Wallsend, and is a three-island type ship, 480 ft. in length and 63 ft. 9 in. in breadth. Double reduction geared turbines will give her a speed of 16 knots.

She is the first Cunarder to bear this name.

* * *

A new name which will feature in English Cross Channel sailings this year is that of *Halladale*. With this ship, Townsend Bros. Ferries Ltd. will resume their ferry service between Dover and Calais, formerly maintained by their S.S. *Forde*. She was built in 1944 as H.M.S. *Halladale*, a River Class Frigate. Now she has accommodation for 60 motor-cars and 300 passengers. With a length of 301 ft. she is considerably larger than her predecessor. The *Forde*, herself an ex-naval vessel, was sold last year to the Bland Line of Gibraltar, who now run her as the *Gibel Tarik*.

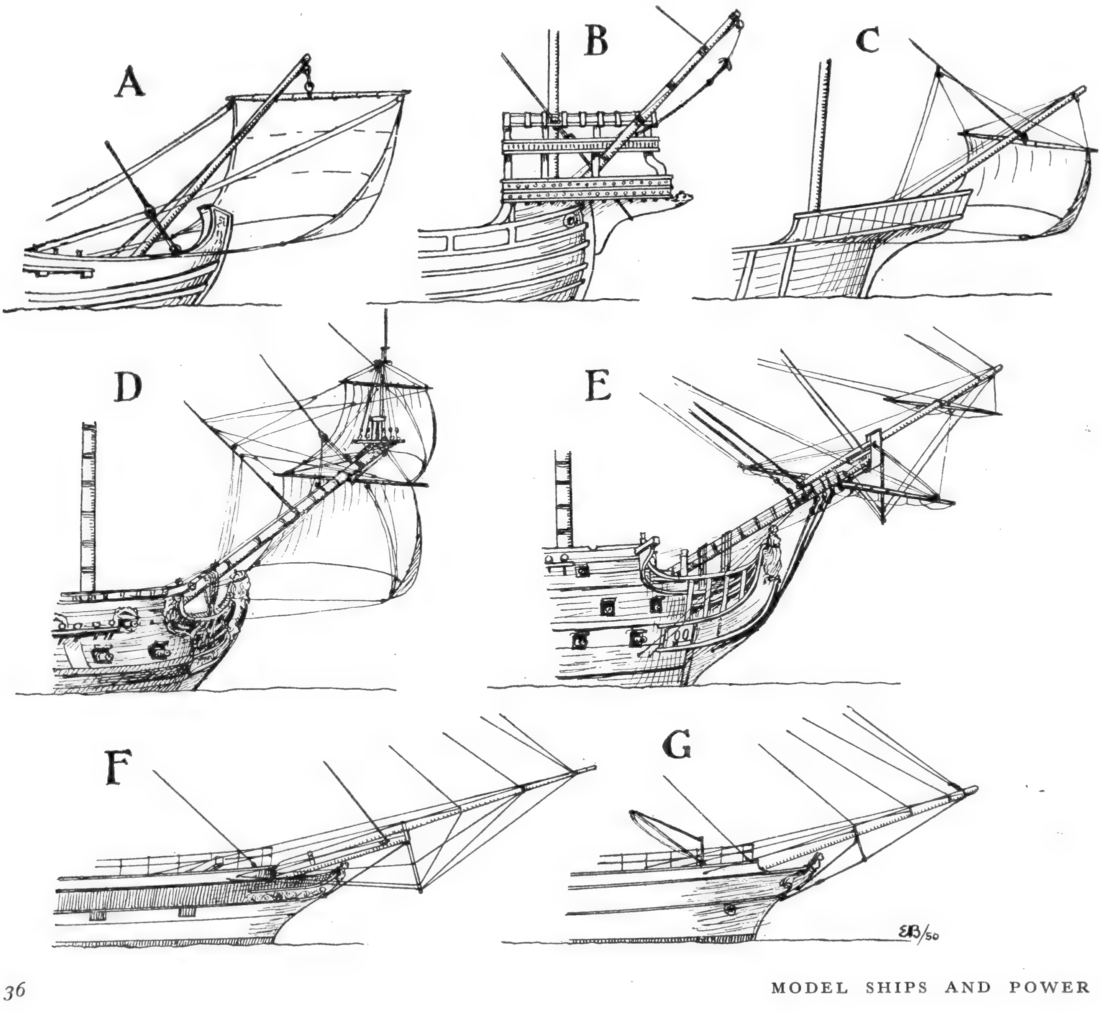
* * *

The veteran Transatlantic motor liner *Gripsholm*, of the Swedish American Line, has been reconditioned and modernised by Howaldtswerke, at Kiel. Externally, as well as internally, this 18,134-ton ship looks very different to when she was built on the Tyne 25 years ago. Now she has wide motorship type funnels, each eight metres wide, instead of five metres as before. The hull forward has been rebuilt and she now has a sharply raking stem, which has increased her length by 16 ft. Internally, she has been converted to carry first and tourist class passengers instead of three classes, the total numbers having been reduced from 1370 to 970.

The Shipmodeller's Scrapbook

BOWSPRITS

THE earliest known form of bowsprit was the Artemon, which was found on the Roman sailing ship in the second century, A.D. This was almost a second mast running out over the bows (see *A*), but it bore a remarkable resemblance to the bowsprits of the ships of many centuries later and carried a spritsail on a yard in almost the same manner. The bowsprit re-appeared in the 13th century in the form of a spar rigged out forward to carry a block from which the grapnel was suspended in readiness for boarding. The stay for the single mast was secured to the stem. When the three-masted ship was introduced the stay for the foremast was secured to the bowsprit, but as the bowsprit had neither gammoning nor a bobstay to hold it down, one purpose of the stay was probably to support the bowsprit from the mast against the strain of the grapnel when in use. A secondary function of the bowsprit was to give a lead from a suitable forward position for the bowlines of the foresail. The spritsail re-appeared at about the end of the 15th century (see *C*). At this time there were no headsails apart from the spritsail which was carried from a yard on the bowsprit, although, of course, the foremast was stepped well forward in the bows. Gammoning was introduced toward the end of the 16th century, possibly to make the bowsprit more effective as a point from which to stay the foremast. During the 17th century a small, upright mast was stepped at the end of the bowsprit in order to carry a topsail



above the spritsail (see *D*). The bowsprit was held down only by gammoning as the presence of the spritsail make it inconvenient to fit a bobstay. The jib was introduced, at first in small ships only, in 1705. The jibboom gradually displaced the spritsail topmast although in the largest ships the spritsail topmast was found as late as 1845, often in uncomfortable combination with the jib and jibboom. The sprit topsail was retained, being carried on a yard underneath the jibboom, the jib, of course, being carried on the topmast stay. The jibboom was led through the cap at the end of the bowsprit and secured along the top of the bowsprit. The dolphin striker or martingale was carried down from this cap to support the stays for the jibboom. The jib was found to be just as effective as the spritsails in bringing round the head of the ship, and in addition it had a lifting tendency which helped to keep the ship dry in a seaway. Owing to the presence of the jibs the bobstay was introduced to assist the gammoning in holding down the bowsprit, but it had to be kept aft of the spritsail yard and thus was not so effective as it would have been if it could have been taken to the end of the bowsprit. To make up for this as many as three bobstays were fitted in the larger ships of the line, as shown at *E*. Shrouds were also fitted to steady the bowsprit sideways, being secured in the lower wale on each bow. With the disappearance of the spritsail the bobstay and shrouds were taken to the cap at the end of the bowsprit.

Up to the middle of the 19th century when the hull of the ship was still comparatively short and the foremast was stepped well forward in the bows, the jibboom increased in length until in the tea clippers it was over 60 ft. long (see *F*). During this time the steeve or upward angle of the bowsprit was gradually reduced. Whereas with the earliest forms of the bowsprit the steeve was about 45 deg., by Nelson's time it had come down to about 30 deg., and by the middle of the 19th century it was only about 18 deg. With the long overhang of the jibboom at this period it was customary when in port to rig it in so as to economise in quay space and to avoid fouling other ships. With the introduction of the iron and later the steel hull and spars, there was a great increase in the dimensions of the sailing ships. As the length of the hull was increased and the foremast was stepped relatively further aft, the bowsprit and jibboom were gradually reduced in length until by about 1880 the jibboom was discarded altogether and the bowsprit became a single spar known as the "spike" bowsprit. This was the type universally used to the end of the era of the sailing ship (see *G*). And which was used in practically all the early steamships.

THE "M.E." SPEED BOAT COMPETITION RESULTS FOR 1949

Name of Boat	Owner	Total Weight lbs.	Engine		Hull		Propeller		Speed m.p.h.
			Cyls.	Type	Length	Max. Beam	Dia.	Pitch	
				Class "A"—Steam					
Ifit VI ...	A. W. Cockman ...	$15\frac{1}{2}$	2	s.a.	38	$11\frac{1}{2}$	$3\frac{1}{4}$	$6\frac{1}{2}$	43·4
				Class "A"—Petrol					
Faro ...	K. G. Williams ...	$15\frac{3}{4}$	1	4 str.	40	12	3	6	56.8
Blue Streak ...	S. H. Clifford ...	$10\frac{3}{4}$	1	4 str.	34	9	$3\frac{1}{2}$	$6\frac{1}{2}$	55·6
Samuel ...	W. H. T. Meageen	10	1	2 str.	32	10	$3\frac{1}{4}$	8	46.49
Rene VI ...	W. Tomkinson ...	$10\frac{1}{4}$	1	2 str.	36	14	$3\frac{5}{8}$	9	38.6
Enid ...	R. Thomas ...	$15\frac{3}{4}$	1	4 str.	$35\frac{3}{4}$	12	3	$6\frac{1}{2}$	37·19
				Class "B"—Steam					
Vesta II ...	F. Jutton	7	1	s.a.	28	$12\frac{1}{4}$	3	$7\frac{1}{2}$	51
				Class "B"—Petrol					
Sparky II ...	G. A. Lines ...	6	1	2 str.	33	13	$3\frac{1}{2}$	8	58.75
Beta ...	R. E. Mitchell ...	$8\frac{1}{4}$	1	4 str.	32	$15\frac{1}{2}$	$3\frac{1}{4}$	5	45
Sparky I ...	G. A. Lines ...	$5\frac{1}{2}$	1	2 str.	29	11	$2\frac{7}{8}$	6	42.94
Sharkie ...	H. V. Collins ...	$6\frac{3}{4}$	1	4 str.	33	9	$2\frac{3}{4}$	5	40
				Class "C"—Petrol					
Jo Mac ...	D. Innes	$4\frac{1}{4}$	1	2 str.	30	9	$2\frac{3}{4}$	4.5	44·7
Moth ...	J. H. Benson ...	$3\frac{1}{8}$	1	2 str.	27	10	$2\frac{5}{8}$	6	38.2
Jinx	A. A. Sherwood ...	$\frac{7}{8}$	1	2 str.	15	$5\frac{1}{2}$	$1\frac{1}{2}$	5 app	29.1

An interesting article on this competition with a review of present day tendencies in hydroplane and engine design, and illustrations showing some of the boats, was published in *The Model Engineer* for February 16th, 1950.

Editor's Correspondence

A SAILING MODEL GALLEON

DEAR SIR: I am writing to you to obtain a little information on a project of mine. The idea I have in mind is to make a sailing model of a galleon! It is, perhaps, a crazy notion, but if I build a working model—well, it just has to be a galleon. Now to the questions.

I understand that a scale model will not float unless one increases the beam and depth—but by how much does one do this? I read G. F. Murray Butcher's article on his sailing model clipper *Enchantree*, but I am still clueless on how he managed to work out the displacement and the subsequent weight of the lead ballast.

I intend to build the model on the rib and stringer principle and I would like to ask you what kind of wood would be best (I was thinking of balsa for the planks).

Perhaps you could suggest a book or two that could give me some clues on the subject of making and sailing model sailing ships. Are the rigging lines different on galleons as opposed to clippers and the like? Perhaps I would have to get a book on galleon rigging.

Anyway, there's my problem and I can only hope that you can help me.

Thanking you,

Yours faithfully,

Dundee. J. RUSSELL, Jr.

In reply, the chief thing to remember is that most pictures of old ships were drawn out of proportion, the masts being too high and the ship, as a whole, too short and dumpy to be seaworthy. So far as we know, the beam varied from a third to a quarter of the length of the ship, and the draught would be not less than half the beam of the ship, probably considerably more than that, In making a sailing model, the height of the masts should be comparable with that of the masts of the modern sailing ship. The hull must be built as light as possible and the masts and spars should also be made light. You will, of course, realise that the larger you make your model, the greater is its displacement compared with its length. If you make your model 30 in. long by 10 in. beam by 5 in. draught, the displacement will be between 35-40 lb. If you plank the hull, as you suggest, it should weigh not more than 5 or 6 lb.; to this must be added the weight of masts, spars and sails, which will leave you nearly 30 lb. for a lead keel. This would probably have to be a false keel for a galleon model, but I think a model of these dimensions would be reasonably satisfactory. For planking use $\frac{1}{8}$-in. satin walnut or similar close-grained wood—not Balsa. For working plank ends around bluff bows or other severe bends, they may be planed down to 3/32 in. or even $\frac{1}{16}$ in.

There is no book dealing with sailing models of this type, the only available book dealing with the rigging for this period being the book "Period Ship Modelling," which we published recently. The rigging described in this book was for an exhibition model, but would apply also to a sailing model. The general scheme of rigging of a galleon is similar to that on clippers, allowing, of course, for the evolution that took place during the two or three hundred years' interval.

THE MODEL YACHTING INTEREST

DEAR SIR: The members of the B.M.Y.C. feel that MODEL SHIPS AND POWER BOATS does not contain sufficient material of interest to model yachtsmen. That this state of affairs is due to lack of support from the clubs cannot be doubted, and with this in mind, our committee have passed a resolution that, in future, the B.M.Y.C. will submit for publication regular reports of our club's activities and articles of especial interest to model yachtsmen.

In furtherance of our adopted policy of endeavouring to justify our claim to more space, I have been instructed to forward the enclosed list of (15) members who wish to subscribe to MODEL SHIPS AND POWER BOATS. I would, therefore, ask you to accept this as an indication of eagerness on our part to persuade you to satisfy the demand for articles devoted to the sport of model yachting.

The B.M.Y.C. has decided to discontinue its subscription to MODEL SHIPS AND POWER BOATS, but I would hasten to point out to you that we are taking this step after first making certain that our members will give you their individual support, thus giving us a good foundation on which to base our claim.

I trust you will give our point of view your careful consideration, and can assure you of the B.M.Y.C.'s wholehearted support in furthering the sport of model yachting.

Yours faithfully,
A. EVANS,
Assist. Racing Sec.,
The Birmingham Model Yacht Club.

We are in the fullest agreement with our correspondent, and if other clubs, and lone hands also would send us news and articles about model yachts, especially about their construction and sailing, we would be pleased to consider them for publication. We have already added to our plans service a series of designs by Mr. A. W. Littlejohn and have in preparation a book on building a 30-in. Sharpie and a 36-in. restricted bread-and-butter yacht by Daniels and Tucker. We are also re-writing our book on Model Sailing Yachts. All this, together with Mr. Tansley's article on his 36-in. restricted "Skylark," may be taken as a proof of our interest in this very absorbing branch of ship modelling.

News from the Clubs

The Festival of Britain Exhibition, 1951. Ship modellers throughout the country should now be considering what part they can take in the exhibition. Col. B. W. Rowe, of the Council of Industrial Design, took advantage of last year's *Model Engineer* Exhibition to meet some of the leading personalities in the modelling world. An advisory committee was formed to examine ways and means of utilising the work of modellers. As the exhibition will not be confined to one site but will be dispersed in a number of centres appropriate to particular industries, this will give local societies a chance to share in the work of showing Britain's achievements in the arts, science and industry. The main exhibition will be on the South Bank Site, London, adjacent to Waterloo Station. The Council of Industrial Design hope to have a representative collection of ship models on exhibition. These would be selected models including some of the championship cup winners where and if available. Among the centres listed as Ship Exhibition Centres are Southampton, Hull, Greenock, Dundee, Plymouth, Menai Straits, Newcastle and Belfast. Strangely enough there is no mention of Liverpool, Manchester, Glasgow or Bristol. Local societies for ship modelling should first enquire at the Mayor's Parlour and at the same time should offer their advice and co-operation. It would be advantageous also for the ship, engineer, locomotive and aero modellers to join forces for the exhibition. I shall be glad to hear from secretaries as to intentions and progress. Societies, when discussing this matter among themselves, should not overlook the historical side of their locality in relation to ships and types of ships.

The Thames Ship Model Society. Mr. H. V. Evans had a very successful first anniversary meeting of the society at the Holborn Library, Gray's Inn Road, last January. On February 22nd Mr. Basil Lavis gave a very interesting lecture on H.M.S. *Victory*. This was illustrated by slides from his own photographs and was very much enjoyed by the large company present. His syllabus is one which excites the envy of any society secretary. In addition to well-known speakers at the monthly meetings on the R.R.S. *Discovery*, there is also a mid-monthly meeting for ship modellers. These meetings are open to all ship modellers so make a note of the time, date and place : 7.15 p.m., the second Thursday in each month, aboard R.R.S. *Discovery*. On April 13th Mr. E. T. Westbury, the well-known authority on model power boats, will give a lecture on this subject. On April 26th, Dr. R. C. Anderson, Litt.D., F.S.A., one of the greatest authorities in the world on Tudor-Hanoverian ships, will address the society. His subject will be the little known but fascinating one of "The Galley ; from Classical to Napoleonic Times."

The Sheffield Ship Model Society holds its annual exhibition during Easter week. This function attracts entries from half a dozen counties. The ship modellers work in conjunction with the engineers and the aeromodellers, and the opening is attended by prominent local citizens. Birmingham and Leicester modellers are coming along again and it will be fine to see these three societies in friendly rivalry. Young societies should note it well. The annual exhibition is the stimulus for the whole year's work.

The above notes are from our contributor 'Jason'

MODEL YACHT SAILING ASSOCIATION. (ROUND POND)

The 1950 season opened on February 18th with a Marblehead event and the following open competitions have been arranged :—

April 1st. Phoenix Cup 10 Rater. This is a clock race open to all classes commencing at 3 p.m. and entries made on the pond side,
April 8th. Dacie Cup, 10 Rater.
April 22nd Open Championship Cup. Marblehead.

SOUTHEND-ON-SEA MODEL POWER BOAT CLUB

This new club is already very much alive. A meeting was held at the headquarters during February at which nearly 40 members were present, and five new ones enrolled. Three silver challenge cups were presented by Mr. Cliff Fenton for steering, nomination and Junior competitions. A prize was given by Mr. F. Bradford for Radio Control competitions. Messrs. H. Brown and B. Shaw gave a prize for the best prototype. It was announced that a dinghy had been purchased for the purpose of retrieving casualties. Further particulars of the club can be obtained from the secretary, J. L. Harrison, 10, Broadclyst Gardens, Thorpe Bay, Essex.

BRIGHTON AND DISTRICT SOCIETY OF MODEL AND EXPERIMENTAL ENGINEERS

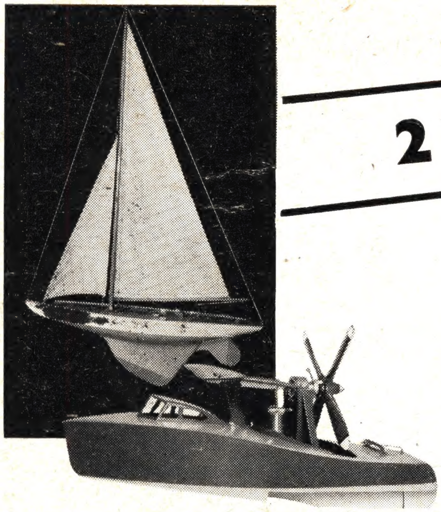
A hearty welcome was given to Mr. E. T. Westbury when he visited this society on February 13th, to give his lecture on "Suitable Machinery for Model Ships." In a most interesting and instructive talk, Mr. Westbury dealt with all kinds of marine engines from simple to intricate steam plant, i.c. types, and diesel, each example being illustrated by photographs projected by the club's episcope. A number of the actual engines were on the table and were closely examined by a crowd of eager enthusiasts. Brighton looks forward to the next talk from this distinguished and popular visitor.

MODEL YACHTING ASSOCIATION

Leicester reports that after a trying wait, the club has gained a real model yacht pond and premises with permission to sail on Sundays. The club is now prepared to receive visits from other clubs, particularly those in the Midlands. The pond is not large, but is open, except from the east.

The following are M.Y.A. British Open Championships, up to May, 1950 :—

Class	Date	Water	Entries close	Boats per club	Entry fee	O.O.D. apptd.
6m.	May 20th and 21st.	Port Glasgow, Mill Dam	April 22nd.	1	7/6	W. Bunton
36 in. Res.	May 27th, 28th and 29th.	The Lake, Dovercourt	April 29th.	3	7/6	C. Seabrooke



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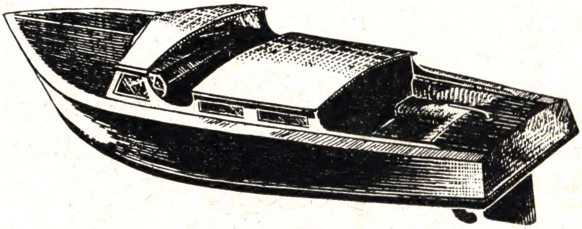

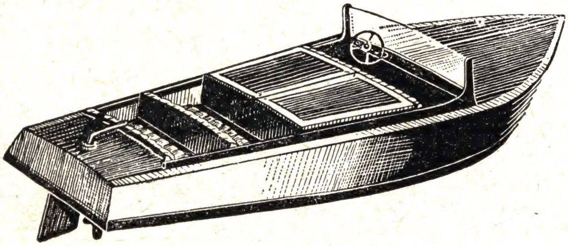

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